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constellation. The symbolism therefore seems to refer to the annual descent of the sun from the sign Cancer, the northernmost point in the solar journey, at the solstitial noon of the year.

Towards the west was the mound and temple dedicated to Itzamna as lord of the dead. It contained the image of a hand, because on this spot Itzamna healed those who were ill and restored the dead to life by laying his hand upon them, whence it bore the name Cab-ul the Working Hand. In this aspect Itzamna may be identified with the death god A of the codices who rules the Mayan uinal Xul or End in October–November and represents Scorpio, the death sign.

Towards the southwest was the temple of Hun-pictok, the Warrior, or the Commander of Eight Thousand Lances. This was an arsenal and the headquarters of the army. Beside one of the two colossal heads upon the facade of this pyramid may still be seen the double spiral xonecuilli symbol which connoted the sign and constellation Sagittarius for the Mexicans. It also referred to the gods of war, and to Orion the Warrior, who represented Sagittarius as a catasterism.

At the south stood the temple of Itzamna in the aspect of the Cosmic Spirit, represented in the codices by the god D and the sign Capricornus.

Finally Lizana describes the temple called Papp Hol Chac, House of Heads and Lightnings. He does not locate it, but Charnay writes of it as facing the Kinich Kakmo pyramid from the south. In it dwelt the priests who administered justice and foretold the future. Apparently the reference is to the tlahtouani or diviner of the Mexicans, Maya chilán, who imparts the wisdom supposed to be obtained from the spirits of the dead, and who is associated with the constellation Teoyao-tlatohua, our Libra-Scorpio. In this instance the former sign seems to be represented. Lizana also mentioned four roads which extended from Izamal towards the cardinal points.

Each of the five edifices described by Lizana was associated with a zodiacal sign. Their relative positions correspond correctly to those of the signs they represent. The original plan of Izamal consisted of twelve temples each representing a zodiacal sign in its proper relative position in the zodiacal circle. These structures were grouped around an undefined central space from which the four roads divided the country into four provinces corresponding to the celestial and cosmical quartering of the solar path by the solstices and equinoxes. The basis of this plan was therefore the imitation upon earth of the supposed celestial plan. It is identical with the plan of Cuzco, the

Inca capital,² a plan most appropriate to a sacred city of priests who watched the stars. The Izamal symbols repeat throughout those of Peru, indicating intercommunication, direct or indirect, between the Mayas and the Peruvians at some time.

In "Social Institutions of the Tinglayan Igor-otes," Mr. Daniel Folkmar gave some of the results of his work for the Ethnological Survey of the Philippine Islands while Lieutenant Governor of Bontoc.

The following papers were read by title:

Measurements of Mixed and Full-blooded Dakota Children: Dr. CLARK WISSLER.

Height in the American Indians: Dr. ALĚS HRDLÍČKA.

Memorial Address for Otis T. Mason: Dr. WALTER HOUGH.

Archeological Explorations in Manitoba: Professor HENRY MONTGOMERY.

Some Inventions of the Ancient Hawaiians: Mr. WILLIAM A. BRYAN.

Committee Report on the Preservation of American Antiquities: Dr. E. L. HEWETT (Secretary).

Ballads and Songs of Western North Carolina: Miss LOUISE RAND BASCOM.

Folk-Lore from the Southern States: Dr. JOHN P. CROSS.

Folk-Music in America: Mr. PHILLIPS BARRY.

Notes on the Northern Wintun Indians: Mr. F. B. WASHINGTON.

Traditions of the Coos Indians of Oregon: Mr. LEO FORCHBENBERG.

Observations on Esoteric Narratives on the Source of Myths: Dr. CLARK WISSLER.

Sketch of the Yuchi Language: Dr. FRANK G. SPECK.

Songs of the Western Cowboys: Mr. GEORGE WILL.

The Importance of Recording Negro-Lore, Dialects and Melodies: Miss MARY W. F. SPEERS.

GEORGE GRANT MACCURDY,
Secretary

THE AMERICAN ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE
SECTION K—PHYSIOLOGY AND EXPERI-
MENTAL MEDICINE

SUMMARY OF THE PROCEEDINGS

THERE were two meetings of the section in the auditorium of the physiological building at the Johns Hopkins Medical School during convocation week, as follows:

² See author's paper on "Cuzco, the Celestial City," in *Proceedings of the International Congress of Americanists*, New York, 1902.

First Session.—Tuesday afternoon, December 29, 1908. Presiding officer: Vice-president William H. Howell. The program consisted of: (1) an address by the retiring vice-president, Ludvig Hektoen, on Opsonins and other Antibodies,¹ and (2) a symposium on The Regulation of Physical Instruction in Schools and Colleges from the Standpoint of Hygiene.

Second Session.—Wednesday afternoon, December 30, 1908. Presiding officer: Vice-president William H. Howell. Joint session with the American Physiological Society, the Society of American Bacteriologists and the American Society of Biological Chemists. This session was devoted to three general papers (see scientific proceedings below).

EXECUTIVE PROCEEDINGS

The following officers were elected for the ensuing term:

Vice-president of the Association and Chairman of the Section—Charles Sedgwick Minot.

Secretary—George T. Kemp.

Sectional Committee—William H. Howell, vice-president, 1908–9; Charles Sedgwick Minot, vice-president, 1909–10; George T. Kemp, secretary, 1909–13; Frederick G. Novy (one year), Graham Lusk (two years), Jacques Loeb (three years), E. P. Lyon (four years), William J. Gies, secretary 1904–9 (five years).

Member of the Council—W. G. MacCallum.

Member of the General Committee—William W. Ford.

SCIENTIFIC PROCEEDINGS

I. FIRST SESSION.—(1) Vice-presidential address and (2) symposium on college athletics.

Program

Address by the retiring chairman, Dr. Ludvig Hektoen, professor (and head of the department) of pathology and bacteriology, University of Chicago. Subject: Opsonins and other Antibodies.²

Symposium—Subject: "The Regulation of Physical Instruction in Schools and Colleges from the Standpoint of Hygiene."

Introductory remarks by the chairman, Dr. William H. Howell, professor of physiology, and dean, Johns Hopkins Medical School.

The Regulation of Physical Instruction in Schools and Colleges from the Standpoint of

Hygiene: Dr. R. Tait McKenzie, professor of physical education, University of Pennsylvania.

On the Physiological Effects of Moderate Muscular Activity and of Strain: Dr. Theodore Hough, professor of physiology, University of Virginia.

Physical Exercise from the Standpoint of Physiology: Dr. Frederic S. Lee, professor of physiology, Columbia University.

Departmental Organization for the Regulation of Physical Instruction in Schools and Colleges from the Standpoint of Hygiene: Dr. Thomas A. Storey, associate professor and director of physical instruction, College of the City of New York.

General discussion.

II. SECOND SESSION.—General papers in joint session with the American Physiological Society, the Society of American Bacteriologists and the American Society of Biological Chemists.

Program

Anaphylaxis: Dr. M. J. Rosenau, director of the hygienic laboratory, Public Health and Marine Hospital Service, U. S. A., Washington.

The Physiological Significance of Creatin and Creatinin: Dr. Lafayette B. Mendel, professor of physiological chemistry, Sheffield Scientific School, Yale University.

The Venous Pulse: Dr. Albion W. Hewlett, professor of the theory and practise of medicine and clinical medicine, University of Michigan.

General discussion.

PAPERS AND ABSTRACTS (I. AND II.)

I. Papers comprising the symposium on The Regulation of Physical Instruction in Schools and Colleges from the Standpoint of Hygiene. By Drs. Mackenzie, Hough, Lee and Storey. (To be published in SCIENCE, March 26 and April 2.)

II. Papers comprising the program of the joint session with the bacteriologists, biochemists and physiologists. By Drs. Rosenau, Mendel and Hewlett.

Anaphylaxis: M. J. ROSENAU. (Will be published in the *Archives of Internal Medicine*.)

The Physiological Significance of Creatin and Creatinin: LAFAYETTE B. MENDEL. (Will be published in SCIENCE.)

The Venous Pulse: ALBION WALTER HEWLETT.

The typical venous pulse consists of three main waves which have been designated the *a*, *c* and *v* waves, respectively. A comparison of the jugular pulse with that of the carotid artery shows that the *c* wave occurs almost simultaneously with the carotid pulse. The *a* wave precedes the *c* wave

¹ See SCIENCE, Vol. XXIX., p. 241, 1909.

² See SCIENCE, Vol. XXIX., p. 241, 1909.

by an interval of about 0.18 second. It is caused by the contraction of the auricle. In some tracings the *a* wave is very prominent, greatly overshadowing the succeeding *c* wave. This was noted particularly in patients with more or less decompensation, though it is not pathognomonic of such conditions.

The *c* wave occurs almost simultaneously with the carotid pulse and in some instances it is caused by a transmitted arterial pulsation. The earlier writers, especially Francois Franck, Fredericq and Gerhardt regarded the *c* wave as a true venous wave, but Mackenzie and Wenckebach believe that it is always a carotid pulse. Recent investigations, however, tend to show the correctness of the earlier views; for, (1) the *c* wave can often be recognized by inspection as being present in the veins themselves, (2) it often precedes the carotid pulse by about 0.02 second, (3) it has a different form, (4) it can occasionally be demonstrated on liver tracings, and (5) in pathologic venous tracings, especially from cases of auricular paralysis, the *c* wave on the jugular differs in size from the radial pulse, often being largest when the radial is smallest. In most tracings, therefore, the *c* wave is of venous origin; when of arterial origin, this is generally indicated by its form.

The venous *c* wave is probably to be referred back to the momentary increase in intra-auricular pressure which occurs at the onset of ventricular systole. This wave of increased pressure appears somewhat later in the neck on account of the slow transmission of venous waves.

The negative wave following the *a* wave is undoubtedly due to auricular diastole. That following the *c* wave may also be explained in part by auricular diastole; but it is evident (1) from heart block tracings and (2) from tracings of auricular paralysis from man and from animals that ventricular systole alone is capable of causing a negative wave in the venous pulse just after the *c* wave. This is caused by the descent of the ventricular base during systole, which opens up the auricle on its attachments to the great veins.

Tracings from a patient with palpitation showed a very marked *c* wave and a very marked depression immediately following. As other venous waves were merely indicated on the tracing, it seems probable that the earlier movements of the ventricle during systole were executed with unusual speed.

The *v* wave appears in the neck just after the time of the dicrotic notch on the arterial pulse.

Owing, however, to the slow transmission of venous waves the *v* wave begins in the heart at a somewhat earlier period, probably in late systole, and it is terminated there by the opening of the tricuspid valves. It is probably due partly to a replacement of the base of the ventricle toward the auricle at the onset of diastole. It is also due in part to the accumulation of blood in the auricle during the closing of the tricuspid valves. The *v* wave is accentuated in conditions of auricular stasis especially in tricuspid insufficiency and auricular paralysis.

The negative wave following the *v* wave is due to the opening of the tricuspid valves and the consequent flow of blood toward the ventricle. It is especially pronounced in conditions of auricular stasis. In slowly acting hearts this negative wave is often followed by a shoulder on the venous tracing which seems to be due to a recoil from the rapid filling of the ventricle.

WILLIAM J. GIES,
Secretary

SOCIETIES AND ACADEMIES

THE WASHINGTON ACADEMY OF SCIENCES

DR. ALFRED G. MAYER, of the Carnegie Institution of Washington, delivered an address before the Washington Academy of Sciences Tuesday evening, February 23, on "The Tortugas Marine Laboratory, its Scope and Aims." Dr. Mayer kindly furnished the following abstract of his address:

"The lecturer called attention to the fact that this laboratory is the only permanent marine station within the American tropics, and that the generous support accorded to it by the Carnegie Institution of Washington had enabled it to develop into the best equipped marine laboratory in the tropical world.

"The seven Tortugas Islands are out in the Gulf of Mexico, seventy miles west of Key West, and consist of coarse wave-washed and wind-blown fragments of marine shells, which afford no soil suitable for the growth of mangroves; and thus the laboratory is unique in being the only place on the seaboard of Florida which is free from endemic mosquitoes in summer.

"Along the mainland coast of southern Florida the winds cause the waters over the coral flats to be churned into a silky mass of suspended silt, which is fatal to pelagic life, but at Tortugas, owing to the great area of deep ocean water in their neighborhood and the small size of the coral